

1 **CLAIMS**

2 1. One or more computer-readable readable media comprising a flash memory
3 driver that is executable by a computer to interface between a file system and one
4 or more flash memory media, the flash memory driver comprising:

5 flash abstraction logic that is invokable by the file system to manage flash
6 memory operations without regard to the type of the one or more flash memory
7 media; and

8 flash media logic configured to interact with different types of the flash
9 memory media;

10 wherein the flash abstraction logic invokes the flash media logic to perform
11 memory operations that are potentially performed in different ways depending on
12 the type of the flash memory media.

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14 2. The flash memory driver as recited in Claim 1, wherein one of the flash
15 memory operations includes performing wear-leveling operations associated with
16 the flash memory medium.

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18 3. The flash memory driver as recited in Claim 1, wherein one of the flash
19 memory operations includes maintaining data integrity of the flash memory
20 medium.

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22 4. The flash memory driver as recited in Claim 1, wherein one of the flash
23 memory operations includes handling recovery of data associated with the flash
24 memory medium after a power-failure.
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1 5. The flash memory driver as recited in Claim 1, wherein one of the flash
2 memory operations includes mapping status information associated with physical
3 sectors of the flash memory medium for use by the file system.

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5 6. The flash memory driver as recited in Claim 1, wherein the flash medium
6 logic is further configured to translate commands received from the file system to
7 physical sector commands for issuance to the flash memory medium.

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9 7. The flash memory driver as recited in Claim 1, wherein the flash medium
10 logic is a user programmable to read, write and erase data to and from the flash
11 memory medium.

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13 8. The flash memory driver as recited in Claim 1, wherein the flash medium
14 logic configured to perform error code correction associated with the flash
15 memory medium.

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17 9. A flash driver, comprising:

18 flash abstraction logic, interposed between a file system and a flash
19 memory medium, configured to:

20 (a) map a logical sector status from the file system to a physical sector
21 status of the flash memory medium; and

22 (b) maintain memory requirements associated with operating the flash
23 memory medium.

1 10. The flash driver as recited in Claim 9, further comprising a user
2 programmable flash medium logic, configured to read, write and erase data to and
3 from the flash memory medium.

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5 11. The flash driver as recited in Claim 9, further comprising a user
6 programmable flash medium logic configured to receive and translate specific
7 operational commands from the file system associated with reading and writing
8 data to the flash memory medium.

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10 12. The flash driver as recited in Claim 9, wherein the memory requirements
11 include managing wear-leveling operations associated with the flash memory
12 medium.

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14 13. The flash driver as recited in Claim 9, wherein the memory requirements
15 include maintaining data integrity of the flash memory medium.

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17 14. The flash driver as recited in Claim 9, wherein the memory requirements
18 include handling recovery of data associated with flash memory medium after a
19 power-failure.

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21 15. The flash driver as recited in Claim 9, further comprising a flash medium
22 logic, programmably configurable by a user to perform error code correction
23 associated with the flash memory medium.

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25 16. A flash driver, comprising:

1 user programmable flash medium logic, configured to read, write and erase
2 data to and from a flash memory medium; and

3 flash abstraction logic, interposed between a file system and flash memory
4 medium to maintain universal requirements for the operation of the flash memory
5 medium.

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7 17. The flash driver as recited in Claim 16, wherein the flash abstraction logic
8 passes specific commands associated with certain types of flash memory media
9 directly to the flash medium logic for translation and execution.

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11 18. The flash driver as recited in Claim 16, wherein the flash abstraction logic
12 is an interface between the flash medium logic and the file system.

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14 19. The flash driver as recited in Claim 16, wherein the universal requirements
15 include maintaining data integrity of the flash memory medium.

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17 20. The flash driver as recited in Claim 16, wherein the universal requirements
18 include managing wear-leveling operations associated with the flash memory
19 medium.

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21 21. The flash driver as recited in Claim 16, wherein the universal requirements
22 include handling recovery after a power-failure.

1 22. The flash driver as recited in Claim 16, wherein the flash medium logic
2 comprises a set of programmable entry points that can be implemented by a user to
3 interface with the type of flash memory medium selected.

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5 23. A processing device that uses a flash memory medium for storage of data,
6 comprising:

7 a file system, configured to control data storage for the processing device;
8 flash media logic, configured to perform physical sector operations to a
9 flash memory medium based on physical sector commands, wherein the flash
10 medium logic comprises a set of programmable entry points that can be
11 implemented by a user to interface with the type of flash memory medium
12 selected; and

13 flash abstraction logic, configured to maintain flash memory requirements
14 that are necessary to operate the flash memory medium.

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16 24. The processing device as recited in Claim 23, wherein the flash abstraction
17 logic passes physical logic commands associated with certain types of flash
18 memory medium directly to the flash memory medium logic for translation and
19 execution.

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21 25. The processing device as recited in Claim 23, wherein the flash abstraction
22 logic is an interface between the flash medium logic and the file system.

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24 26. The processing device as recited in Claim 23, wherein the flash memory
25 requirements include maintaining data integrity of the flash memory medium.

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2 27. The processing device as recited in Claim 23, wherein the flash memory
3 requirements include managing wear-leveling operations associated with the flash
4 memory medium.

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6 28. The processing device as recited in Claim 23, wherein the flash memory
7 requirements include handling recovery after a power-failure.

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9 29. The processing device as recited in Claim 23, wherein the requirements are
10 common to a plurality of different flash memory media.

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12 30. The processing device as recited in Claim 23, wherein the flash medium
13 logic comprises a set of programmable entry points that can be implemented by a
14 user to perform error code correction with the type of flash memory medium used
15 in the processing device.

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17 31. The processing device as recited in Claim 23, whereby the flash medium
18 logic relieves the flash abstraction logic from performing translation of the
19 physical sector commands received from the file system.

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21 32. The processing device as recited in Claim 23, wherein the physical sector
22 operations include read, write and error code correction commands associated with
23 the flash memory medium.

1 33. In a processing device that uses a flash memory medium for storage of data,
2 a method for driving the flash memory medium, comprising:

3 managing rules associated with operating the flash memory medium in a
4 flash abstraction logic; and

5 issuing physical sector commands directly to the flash memory medium
6 from a flash medium logic.

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8 34. The method as recited in Claim 33, wherein one of the rules includes
9 maintaining data integrity of the flash memory medium.

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11 35. The method as recited in Claim 33, wherein one of the rules includes
12 managing wear-leveling operations associated with the flash memory medium.

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14 36. The method as recited in Claim 33, wherein one of the rules includes
15 handling recovery of the media after a power-failure.

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17 37. The method as recited in Claim 33, wherein issuing physical sector
18 commands directly to the flash memory medium comprises receiving read and
19 write commands from a file system and translating them into the physical sector
20 commands.

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22 38. The method as recited in Claim 33, further comprising issuing a set of
23 programmable entry points that can be implemented by a user to perform error
24 code correction with the type of flash memory medium used in the processing
25 device.

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2 39. The method as recited in Claim 33, further comprising issuing a set of
3 programmable entry points that can be optionally selected by a user to interface
4 with the type of flash memory medium used in the processing device.
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6 40. The method as recited in Claim 33, further comprising receiving read and
7 write commands from a file system.
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9 41. One or more computer-readable media comprising computer-executable
10 instructions that, when executed, perform the method as recited in claim 33.
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12 42. A computer-readable medium for a flash driver, comprising computer-
13 executable instructions that, when executed, direct the flash driver to provide an
14 interface between a file system, selected from one of a plurality of different file
15 systems, and a flash memory medium, selected from one of a plurality of different
16 flash memory media.
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18 43. A computer-readable medium for a flash driver, comprising computer-
19 executable instructions that, when executed, direct the flash driver to:

20 provide an interface between a file system, selected from one of a plurality
21 of different files systems, and a flash memory medium, selected from one of a
22 plurality of different flash memory media; and

23 manage a set of characteristics that are common to the plurality of different
24 flash memory media at a flash abstraction logic.
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1 44. A computer-readable medium for a flash driver, comprising computer-
2 executable instructions that, when executed, direct the flash driver to:

3 provide an interface between a file system, selected from one of a plurality
4 of different files systems, and a flash memory medium, selected from one of a
5 plurality of different flash memory media;

6 manage a set of characteristics that are common to the plurality of different
7 flash memory media at a flash abstraction logic; and

8 provide programmable entry points that can be optionally selected by a user
9 to interface with the type of flash memory medium selected.
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